Coal Mining and Rural Ecology: A Study in Talcher, Odisha

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DECLARATION

I, hereby declare that I have completed my final year project on "Coal Mining and Rural Ecology: A Study in Talcher, Odisha" at National Institute of Technology, Rourkela, Odisha in the academic year 2014–2015. The information submitted here by me is true and original to the best of my knowledge and belief.

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CERTIFICATE

This is to certify that the dissertation entitled, "Coal Mining and Rural Ecology: A Study in Talcher, Odisha" submitted by Narendra Jha in partial fulfillment of the requirement for the degree of Master in Arts in Development Studies of the Department of Humanities and Social Sciences, National Institute of Technology, Rourkela, is an authentic work carried out by him under my supervision. To the best of my knowledge, the matter embodied in the dissertation has not been submitted to any other university/ institute for the award of any degree or diploma.

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Narendra Jha

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ABBREVIATIONS

CAMPA- Compensatory Afforestation Fund Management and Plantation Authority

MCL- Mahanadi Coalfield Limited.

NGO- Non Governmental Organization

Abstract

Coal plays a fundamental role in global energy development but it has number of challenges. According to Downing (2002) mining results in large scale displacement of the local people and derails their normal life. There are issues that are required to be addressed in the context of coal abundant but economically poor state like Odisha, for example how does coal mining influence the environment and health of the people? Whether the health policies implemented by the mining companies are discriminating non employees? How is the CAMPA fund utilized by the government agencies. The role of institutions in the mining affected villages is also analyzed in the present study. The study has employed both primary and secondary data which would has been collected from sample surveys, formal and informal interviews from two of the mining affected villages in Talcher. Both qualitative and quantitative data are analyzed in the backdrop of the study using content analysis and Statistical Package for Social Sciences (SPSS) respectively.

Keywords: Coal Mining, Environment, Health, CAMPA

CHAPTER I

INTRODUCTION, LITERATURE REVIEW AND OBJECTIVES

1.1 Introduction

The history of coal mining in India can be traced back to the year 1774 when coal mining was first started by M/s Sumner and Heatly of East India Company in the Raniganj Coalfield along the Western bank of river Damodar. Coal reserves in India stands as one of the largest in the world. India's domestic of coal resources are available in abundance. Most of these are in the state of Bihar, Jharkhand, Orissa, Madhya Pradesh, Chhattisgarh and West Bengal. As on April 1, 2012, India had 293.5 billion metric tons (323.5 billion short tons) of the resource. The production of coal was 532.69 million metric tons (587.19 million short tons) in 2010-11. In India the demand for electricity is very high due to its population. Therefore government in order to derive electricity is going on harnessing coal mines to satisfy the taste and preferences of the people. Coal accounts for about 53 per cent of the nation's electricity generating capacity, while gas and oil account for 10 per cent and 1 per cent respectively.

Odisha has two coalfield but still its share in the reserve are so amounts to 24.89 %(75.07). The two coal fields are Talcher coal field and Ib river coal field .Talcher coalfield was discovered by Lt. kittoe in 1839 and lb River coalfield by V.Ball in 1871 yet the real impetus for resource assessment by systematic exploration efforts was accorded only in the post nationalisation era of the coal industry since 1973, the importance of Orissa coalfields further enhanced due to their vicinity to east coast.

Mining has several social, ecological, economic impacts at the national, state and local level. Mines not only provide ample opportunities in the field of employment to the local habitats but also help the state and nation to generate tax and foreign exchange earnings. Along with the

business motives which are pursued with the mining there are other responsibilities which the mining companies take on such as providing roads, schools, water, health clinics to the community. But mining has also a range of negative impacts on the local communities such as mining displaces people from their own land, natural environment goes on degraded day by day, conflicts among the villagers, sometimes the benefits are not shared with the local communities and loss to culture. Mining may also result in lots of fatal injuries and health concern which may be lethal for the people of the concerned mine areas. No doubt coal plays a fundamental role in global energy development, but the hard hitting fact is that it meets a number of social and environmental long term challenges to demonstrate its role in sustainable development. Introduction

1.2 Literature Review

India is one of the largest producers of coal. Coal in India meets around 67% of the total energy needs of the people. The energy which is derived from Coal is around twice the energy which is derived from oil. The country's domestic consumption is very large and therefore it exploits large amount of coal to meet the needs of the people. Further coal is also exploited to need the power and energy requirements of the nation. The demand for coal in India is said to increase number of times in order to complete the on-going power projects and demand for cement, metallurgical and other industries (Ag metal miner, 2011).

If the statistics are to be believed coal provides around 25 percent of the global primary energy need and 40 percent of the world's electricity consumption. Economic development of a state is very much dependent on coal reserves .It is the main fuel for electricity generation in most of the countries in world. It is an essential element in over 65 percent of the world's steel production (World Coal Institute, 2006). It is the most abundant fuel resource in India. It is the prime source of energy and perhaps the largest contributor to the industrial growth of the country. Over the years, coal has become one of the major sources of revenue in central India. Most of the rural consumers depend on coal for their energy needs. On the other hand the price of per unit energy in terms of coal is way cheaper than any other fuel. For consumers, coal offers excellent value, as it is cheaper per energy unit in comparison with other fuels.

The current per capita commercial primary energy consumption in India is about 350 kg/ year[1]. Petroleum, natural gas, hydro electrical project are in limited reserve in comparison to coal therefore coal in the coming days will continue to occupy a pivotal position in India's global energy scenario.

Coal plays a central role in global development but the associated challenges to it in the sphere of environment cannot be ruled out. The sustainability of resources, life of the people is at stake and is a challenge for the nation as a whole. A great on-going social challenge for the coal mining industry is sustainable development and community acceptance of its role in society.

According to the reports issued by the World Health Organization in 2008 and by environmental groups in 2004, coal particulates pollution are so lethal that there are approximately 1,000,000 lives annually worldwide who fall victim to the pollution caused by mines, including nearly 24,000 lives a year in the United States. Additionally coal mining also generates health related impacts.

Mining activity puts on huge pressure on the local flora and fauna particularly where forests lands are cleared for mining purpose. Mining also results in the degradation of ground water, silting of water bodies. No doubt that that coal mining contributes largely towards economic development but it has a great impact upon the health of the people. It also has its impact on socio-cultural aspect of the workers and people residing in and around coal mining areas. Mining process generates SO2, CO, CO2 and higher hydrocarbons. These gases when reach the atmosphere pollutes the surroundings. (Sribas Goswami, 2013)

A study which was conducted by the Sustainable Energy and Economy Network (SEEN 1996), Institute of Policy Studies, USA, reveals that that Orissa's industries and coal-fired power plants will be emitting the equivalent of 164 Metric Tons(Mt) of carbon dioxide annually, or the equivalent of about 3 percent of the projected growth in manmade greenhouse gases anticipated globally over the next decade. A recent study by Chaulya (2004) shows that in the Ib Valley

1. http://www.coal.nic.in

coalfield area of Orissa the annual average Total Suspended Particulate (TSP) concentration over crossed the mandated standard set by the National Ambient Air Quality Standard (NAAQS) protocol at most residential and industrial areas. Thus, it is imminent that there are serious environment concerns in case of Odisha and coal is a major contributor. The challenge for the coal industry is to reduce the emission of greenhouse gases along with making a contribution to the economic and energy security.

Mining has displaced around 2.6 million people between 1950 and 1951 and not even 25% of the people have been rehabilitated. The major portions of these people who were displaced were tribal. For every 1 per cent that mining contributes to India's GDP, it displaces 3-4 times more people than all the development projects put together (Heldin et.al.1994, WHO 1989). Displacement of people in the development projects, like dams, irrigation projects, thermal power plants, railway lines, highways, mines are unavoidable (Hartman & Howard, 1992).

Mining in India has led to the infrastructure growth but the reality that one cannot supress is the fact that mining has led to impacting the environment and life of the community which are located in adjacent to the mining areas. The implementation of Corporate Social Responsibility programmes of the mining industries is far from satisfactory. The biggest issue in the mining including the coal mining is the Rehabilitation programme for the displaced persons. Displaced people are required to be resettled and rehabilitated in a participative manner keeping in view their requirements, customs and life style (G Kumar 2011).

Mining related displacement in Orissa accounts for more than half of the total displacements related to coal mining in India (SEEN 1996). Mass scale violation has gained its space on the name of mining for development. The three communities in the East Godavari District of Andhra Pradesh i.e., The Nookadora Tribal Group, The Komati Non-Tribal Group and The Khond Primitive Tribal Groups have been threaten by mining for a number of years. The people here are facing the problems of depression, interpersonal relationships, land alienation etc. due to displacement (Goessling, 2010).

Pollution of the water bodies that originate due to mining related activities affects agriculture and the farmers. Paddy yield is affected in a big way because of the accumulation of silt and waste tailings in the fields. In monsoon, water brings with it silt and tailings. This hardens in summer. Sometimes the tailings render the sand unfit even for construction purposes (Sharma 2001).

(Martha, Keating 2011) advocated that coal mining affects land, and other water bodies. Air in and around the locality gets toxicated which in turn damages the plants, animals and human. Open cast mining completely changes the land usage pattern to a kind of use that is not normal. The elements which are present in coal are a large group of pollutants which on combustion affects the health of the local inhabitants. Those elements found in the carbon are a huge matter of public health concern as because at a certain exposure level they can traumatize the health status of the people. They also have the propensity to cause cancer. Many are also respiratory irritants that can worsen respiratory conditions such as asthma effects from coal mining may be the biggest concern in the coal-field regions of the country, while inhalation exposure may be the foremost risk in an urban setting and, in less populated rural state visibility impairment and haze may be of special concern.

1.3 Objectives

In the context of mining there are numbers of effort being taken by the stakeholders in order to prevent negative and lethal impacts that mining can have on its surroundings which includes the local community and the natural ecosystem. There are number of policies which are being formulated and implemented both by the Central Government as well as the State Government in order to ensure the sustainable development of the nation. The environmental concerns as well as fulfilling the basic needs of the local community such as sanitation, access to pure water and medical are being taken by the mining companies as a part of their corporate policy. A lot of steps are still needed to be taken in order to ensure that mining activities attunes to the need of the environment as well as need of the local community. The need of the hour is to ensure that mining is carried out in a more sustainable way. There are certain important issues in the context of Odisha which is an economically poor state but has abundant coal reserves. For example, how does the coal mining influence the health of the local community? What policies are taken up by

the mining companies in order to meet the health related expenses? How does mining influence the livelihoods of rural community?

More specifically, the major objectives of the proposed study would be to -

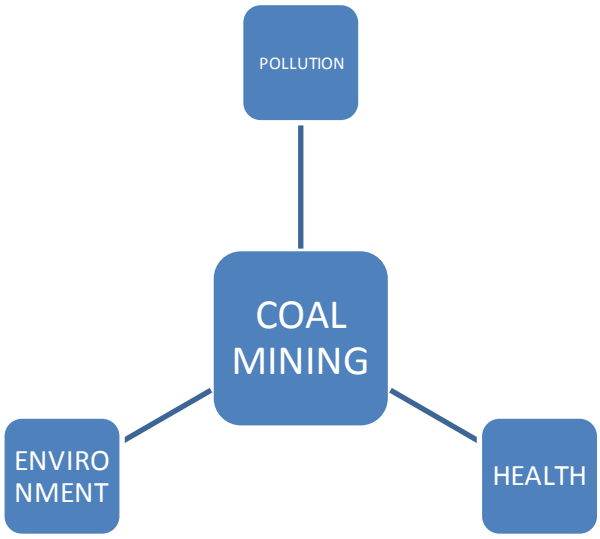
- To identify the implication of coal mining on the environment and health of the local people in the mining affected areas.
- To identify the role of institutions and forest department in the utilization of Compensatory Afforestation Management and Planning Authority CAMPA fund for the safeguard of forest.

1.4 Conceptual Framework

Coal is harnessed and exploited by the mining companies, they sell it and then coal is used by the consumers as a source of energy. The Government in turn gets huge amount of revenue in return as income. However all the negative impacts of coal are borne by the local people who stay in and around the mining area. With the initiation of mining activities the local communities are forced to leave their homestead land and move to other places therefore disturbing the community life. A number of health issues erupt out when the natural environment is manipulated and people suffer from diseases which they had never heard of before.

Thousands of trees are chopped down, forests which are reservoir of fruits, fresh air, natural medicines are destroyed which in turn affects the livelihood and endangers the health status of the people. The activities of mining operation disturb the other natural resources base. Until we analyse implications of coal mining from the context of health, environmental perspectives it will be difficult to assess it. In this study, two major impacts are proposed to be included. They are impact on health and environment. Whether the companies and concerned local authority are taking any measures for the safeguard of the forest and afforestation programmes will be taken into account.

Figure 1.1: A Framework



1.5 Hypothesis

(a) Coal mining has not only taken the agricultural lands of the people but has also displaced the local inhabitants from their homestead land. Coal mining has also destroyed the forest land.

(b) Eye infections, allergy, Gastric problems are in rampant in the mining affected areas. Abandoned mining has multiplied incidence of malaria and accidents.

The present study revolves around the ecological effects of coal mining. Impact of coal mining on health, is analysed.

No doubt, coal mining is adding huge amount of revenue in the official reserves of the government. Coal mining helps in the generation of energy which is essential for the living of the people. Even if there are benefits associated with mining the negative impacts in the form of

noise, air, water pollution, disturbance of the harmonious living of the people which they were continuing since time immemorial. Also displacement of the people from their own land creates lot of panic in the life of the people and community as a whole. The negative impact of the mining is not taken seriously into account. If emphasis is not given to the darker side of the story then it will be very difficult for the government to extract coal in the near future. So it is very important to assess the negative impacts of mining on the life of the inhabitants of the mining areas otherwise in the near future there will be lopsided development and the present benefits will be at the cost of resources of future generations.

1.6 Methodology

In order to accomplish the objectives of the study, data was collected from both primary and secondary sources. The study employs both the quantitative and qualitative techniques of data collection. In order to gather primary data, quantitative data household survey was conducted using the pre- tested schedules. The study basically applied qualitative data analysis techniques such as observation, participatory rural appraisal techniques like focussed group discussions, formal and informal interviews methods is used. For gathering quantitative data household survey was conducted using the pre-tested schedules. During field investigation interaction was held with all stakeholders involved in that mining. In the process number of higher rank officers were contacted in the state and district level in that area. The secondary data for the study purpose was collected from the official records, published reports of similar projects.Reports were also sought from the concerned department through the use of Right to Information Act (2005).

1.7 Universe of study

Data requirements for the study were collected from the Mahanadi Coalfield, Orissa, India.According to the Geological survey of India a total of 253.30 Billion Tonnes (Bt) of coal reserves are estimated as on 1st January 2006. Odisha has two coal fields. Talcher and Ib valley. Talcher has around 64% of the coal fields in Odisha Ib valley is having around 22.36% of coal reserves in Odisha. Coalfield of Odisha comes under Mahanadi Coalfield Limited (MCL), a

subsidiary of Coal India Limited (CIL). Because of the heavy deposits of coal in the area the district is also known as the district of black diamond. Talcher there are 7 open-cast mines namely Balanga, jagannath, Ananta, Kalinga, Bharatpur, Hingula and Lingaraj. The present study is confined to the Talcher coalfield. The villages located in the Talcher area are poverty ridden. There is high intensity of water pollution due to the release of waste water from MCL. There are number of people who have white spots all over their body and also it has been found out from secondary sources that people are suffering from fatal respiratory diseases as well as infections. Looking from the perspective of the indigenous people of this area, huge families have been displaced due to the mining. But the mining authority has not yet provided the basic amenities to these displaced people. The lives of the displaced people in the rehabilitation colony have been completely destabilized – they have been deprived of all possible means of earning a decent livelihood. Coal mining activities in this area started during mid-eighties. Over the years mining operations has been accelerated in this area but there is a dearth of study regarding the environment, health and institutions aspects of coal mining.

1.8 Sampling Procedure

In order to achieve the objectives of the study the target population consists of the people who are affected by mining activities. In Odisha, Talcher region in the Angul district is well defined and Mahanadi Coalfield Limited. (MCL) mining company is operating in number of coal rich areas so it is very easy to define the target population by taking villages which are affected by mining. Two villages were selected based on their vicinity to the mines. The target population known as the sample frame population was drawn. Households for the study were randomly selected from the total population of the affected villages. A list of 02 villages was undertaken according to random sampling procedure. From each of the village 50 households were taken. Therefore total of 100 households were taken for the study.

1.9 Data Analysis

In order to attain the objectives of the study both the qualitative and quantitative data was collected from various sources and the same is analysed using different techniques. Quantitative data was tabulated and statistically analysed using SPSS software using multiple indicators.

Qualitative data is interpreted based on the information collected from the field setting using content analysis.

1.10 Significance of the Study

Odisha is having a number on mining reserves and after the exploration of mines has been done, it will add up a big deal of revenue for the government. However the mining projects have number of challenges. The mining projects are facing number of oppositions from the people especially those people are getting displaced from their lands. The number of conflicts between mining companies and the people are increasing day by day and the issues remain unresolved. There is no coordination between the people and the mining companies.

The corporate interests are backed by the Central and State Governments and as a result of which the voice of the common people is being suppressed. Numbers of studies have been conducted on mining in India but in the context of Odisha it is relatively less. It is very rare to see the study done from anthropological perspectives of mining in context to Odisha. And the study on the impact of mining based on health, environment, will be a value addition to the field of environment sector of Odisha and India.

The results and findings of the study will be very much beneficial in the academics purpose. This kind of study will reveal about the coping capacity of the people with respect to the harmful impacts of mining. Also the participation of the people in the implementation of different programme will reflect about the development whether the development is supply driven or community driven development. Corrective strategies would include macro-level policies (such as pricing and compensation) and local institutions and mechanisms. It would give a new way to solve the displacement issues and peoples movement. Thorough research on this topic will be useful to policy makers, academicians, administrators, planners and etc. in different phases of the implementation of the policy.

CHAPTER 2
STUDY PROFILE

2.1 Coal Mining in India

Coal is an important source of energy in India. Without coal, the energy requirements of the nation would had been very difficult not only in India but across the world. If statistics are to be believed that the primary source of electricity across the world is coal which is estimated to be around 42% (World Coal Association, 2014). The major proportion of coal is found in China, Australia, India, USA etc. India has the fifth largest coal reserve in the world which is chiefly of non-coking nature. Coal mining in India can be traced back to 1774 when East India Company first exploited coal in the Raniganj Coalfield along the Western Bank of Damodar River. Mining operations were manual in nature and the exploration was quiet lethargic. The mining done was open-cast type. During 1815 the first underground mining was carried out in the Raniganj region. The production of coal in India had boosted by 1900 with the expansion of Indian Railways but it went slow in the 1930's. The production of Coal by 1946 was about 40 metric tonnes.

In India, under the Prime Minister ship of Late Jawaharlal Nehru the Planning Commission was formulated so that the allocation of resources could be done properly with robust planning. Accordingly 11 collieries collaborated which led to the formation of National Coal Development Corporation (NCDC) during the year 1956 along with the. The Singareni Collieries Company Limited (SCCL), which was in operation since, 1945. The demand for coal for various sectors basically was increasing day by day. After the end of the first five year plan the production of coal had increased up to 38.4 metric tonnes.

Coal mining which was done before the independence and just after the independence of India was driven by commercial and domestic purpose. Coal mining sector needed a structural reform so that the growing energy needs of the nation could be efficiently solved and the manner in which private players were engaged in mineral exploration was quiet unscientific and the labor condition was of worst kind which raised the concern for the Government of India. The government of India therefore felt the need to nationalize coal in order to cater the need of the nation in totality.

2.2 Nationalization and Coal Reserve in India

The coal mines were therefore nationalized in two phases. During the year 1971 coking coal mines were nationalized whereas during the year 1973 the non-coking coal was nationalized. . Coking coal is one having low ash and phosphorous content used to make coke which is an ingredient in steel production. Non coking coal is one with high ash content which is used in power station Nationalization of coal signified that the management of coal will be done keeping in view the interest of the people.

The first nationalization was done in October, 1971, the Coking Coal Mines (Emergency Provisions) Act, 1971 followed by the Coking Coal Mines (Nationalization) Act, 1972 in which the Tata Iron & Steel Company Limited and Indian Iron & Steel Company Limited, were nationalized on 1.5.1972 and were put under Bharat Coking Coal Limited (BCCL), a new Central Government Undertaking. All the mines were nationalized during the year 1973 when the Coal Mines (Nationalization) Act, 1973 was enacted and is still the principle legislation of coal mining in India.

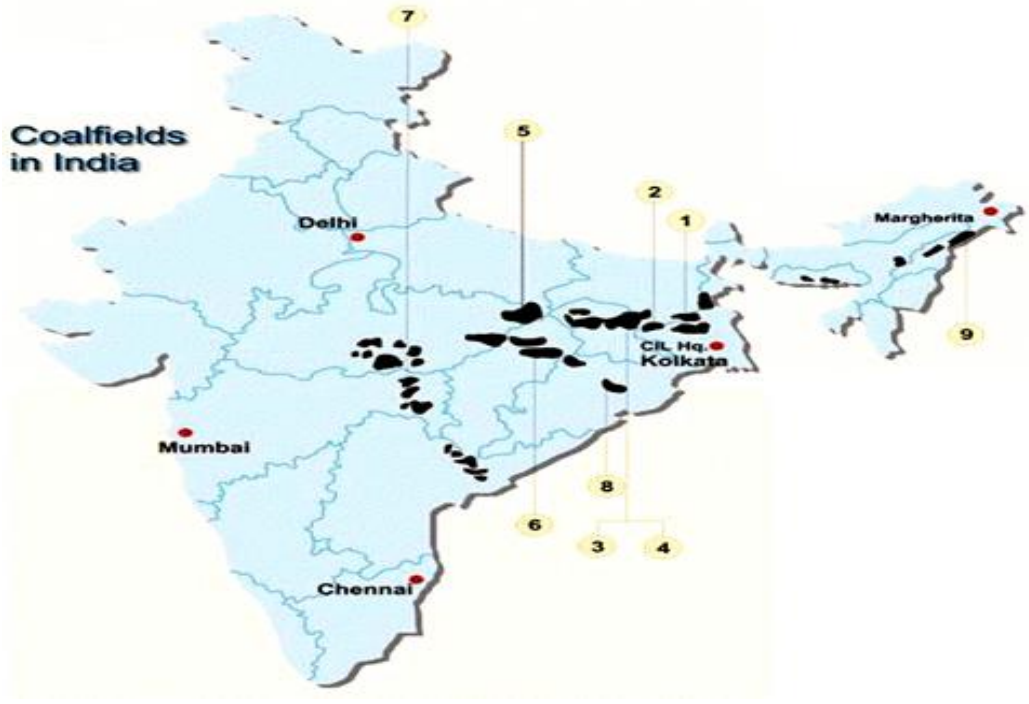
The management of all coking coal mines was taken by BCCL a government of India undertaking and during 1972 the management of non- coking coal was taken by Coal Mines Authority Limited (CMAL) during the year 1973. The CMAL had four divisions to manage the affairs of coal mining namely the Central Division, the Eastern Division, the Western Division and the Central Mine Planning and Design Institute Limited (CMPDIL).

During the year 1975 Coal India Limited (CIL) came into existence with the five subsidiaries namely Central Coalfields Limited (CCL), Eastern Coalfield Limited (ECL), Western Coalfields Limited (WCL), BCCL and CMPDIL. As the demand for coal increased in the nation two more organization was formed by the Central Government in order to balance the demand, production and investment. The two companies so formed were Northern Coalfields Limited (NCL) and South Eastern Coalfields Limited (SECL).

It was also felt by the government that Odisha a coal rich could add significantly in the development of energy sector in the country which led to the formation of Mahanadi Coalfield Limited (MCL) in 1992. MCL was formed to manage the Talcher and Ib valley coalfields in Odisha. It has it's headquarter in Sambalpur.

At present CIL has eight subsidiaries viz. BCCL, CCL, ECL, WCL, SECL, NCL, MCL and CMPDIL (Table 2.1). The CIL and its subsidiaries come under the ambit of Companies Act (1956). CIL adds around 85% of coal production in the nation which makes coal India the largest producer of coal in India.

Figure2.1: Coalfields in India



Source: http://coalindia.nic.in

The above figure taken from the Coal India website reflects about the coalfields which are present in India. 1 refers to ECL which is located in West Bengal which has over 112 mines. 2 indicate BCCL which is located in Dhanbad having 80 mines. 3 indicate CCL which is located in Ranchi and has over 63 mines. 4 indicate CMPDIL which is located in Ranchi. 5 indicate NCL which has over 7 mines located in Singrauli. 6 indicate SECL located in Bilaspur having 97 mines. 7 indicate WCL having around 80 mines. 8 indicate MCL of Odisha which has over 23 mines. 9 indicate NECL which is located in Margherita and which has more than 6 mines.

According to the Geological Survey of India (GSI), India had 253.30 Billion Tonnes (Bt) of coal in India during 2006 of which prime coking coal constituted of 5,313 Bt, medium and semi coking coal constituted of 26.784Bt and non- coking coal constituted of 221.205Bt. India's coal deposit are located and confined to river valleys of Damodar of West Bengal, Mahanadi of Odisha and Godavari of Maharastra and Andhra Pradesh which is collectively known as 'Gondwana' coals. The coal fields of Kerala, Tamil Nadu, Jammu and Kashmir, Assam and Gujarat has very limited coal reserve and they all belong to the tertiary age.

In India Jharkhand accounts for 1/3 of the total coal reserves in India placing Jharkhand in the number one spot in terms of coal reserves followed by Odisha and Chhattisgarh. According to Coal India as on 2012 the estimated coal reserves stood around 293.5 Bt. The following table gives details about the Geological resources of coal of the Gondwana Coal field.

Table no. 2.1: Gondwana Coal Field

State	**Geological Resources of Coal (in Million Tonnes)**			
	Proved	**Indicated**	**Inferred**	**Total**
Andhra Pradesh	9566.61	9553.91	3034.34	22154.86
Assam	0	2.79	0	2.79
Bihar	0	0	160.00	160.00

Chhattisgarh	13987.85	33448.25	3410.05	50846.15
Jharkhand	40163.22	33609.29	6583.69	80356.20
Madhya Pradesh	9308.70	12290.65	2776.91	24376.26
Maharashtra	5667.48	3104.40	2110.21	10882.09
Odisha	25547.66	36465.97	9433.78	71447.41
Sikkim	0	58.25	42.98	101.23
Uttar Pradesh	884.04	177.76	0	1061.80
West Bengal	12425.44	13358.24	4832.04	30615.72
Total	**117551.01**	**142069.51**	**32383.99**	**292004.51**

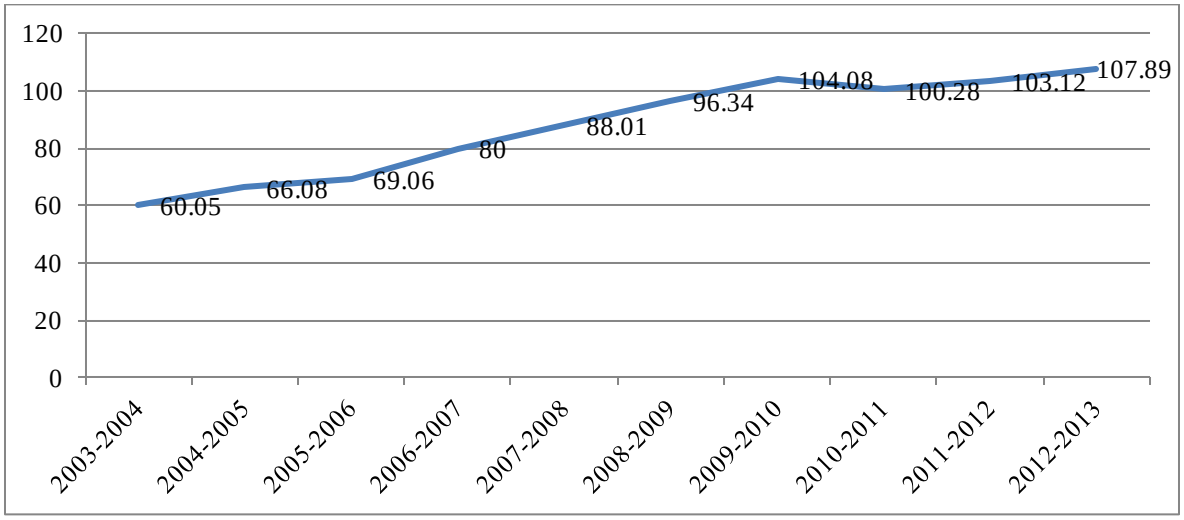
Source: http://www.coal.nic.in/welcome.html

2.3 Coal Mining in Odisha

Odisha has huge mineral reserves. Coal reserves are in abundant in Odisha. It is estimated that Odisha is just after Jharkhand in terms of coal reserve. As per records, mining in Odisha started had started during the year 1900's. First mining activity took place in the Ib valley of Odisha. Due to the increasing demand of coal from both the public as well as private sector the excavation of coal accelerated. There are two major coalfields in Odisha one is the Talcher coalfield and the other is the Ib valley coalfield. These two coalfields come under the Mahanadi Coalfields Limited, which is a subsidiary of Coal India formed for Odisha.

Indian Energy Sector estimates that Odisha has a total of 73.71Bt of coal reserves. The Talcher coalfield has around 40.47Bt of coal whereas Ib valley has around 22.36Bt of coal. Talcher coalfield is located in the Angul district of Odisha. Talcher coalfield lies between latitudes 200 53' N and 200 12' N and longitude 840 24' E and 850 33' E. The first mining activity was started by Gopalprasad during the year 1837. The following graph which is taken from the MCL website reflects about the coal production by MCL during the recent years. The coal production by MCL has increased from 60.05Metric tonnes (Mt) during the year 2003-04 to 107.89Mt by the year 2012-13.

Figure 2.2: Year wise coal production by MCL



Source: http://mahanadicoal.nic.in

2.4 Introduction to the study area

The present study revolves around Talcher region of Odisha. Talcher is one of the prominent sub- divisions of Odisha as it is rich in coal reserves. It is also known as the coal town of the state. Talcher coalfield is located to the north of Mahanadi River in Brahmani Valley. MCL website states that the coalfield has an estimated area of 150966 sq.km. The coalfields of Talcher comes under the ambit of Mahanadi Coalfields Limited (MCL) which is a public sector organization controlled by Coal India limited (CIL). Talcher coalfields are rich in non- coking coal which is an important ingredient in the thermal power plant. At present there are eight open cast and three underground mines. The coalfields are present in different area which are named as Jagannath area, Bharatpur area, Lingaraj area, Hingula area and Talcher area. The present study primarily focuses on the impacts of opencast coal mining in the mining affected areas. The sample consists of two villages called affected areas which are located in Talcher. 100 household

data were collected from the sample villages via schedules. The following table reflects about the key features of the affected villages:

Table no. 2.2: Key features of sample villages

Features	Jambubahali	Hensmul
Distance from nearby mines (in kms)	0-6	0-6
Total population	1020	1112
Social Composition	General, SC,OBC	General, SC,OBC
Total number of Households	158	167
Livelihoods	Employee of Mining companies and wage labour	Employee of Mining companies and wage labour
Electricity	Yes	Yes
Source of Drinking water	Given by Mining company through tractor	Tube well, given by mining company

Source: Field study

The above table number 3 reflects certain aspects of the sample village in terms of distance from the mines, electricity availability, social composition etc. Both Hensmul village and Jambubahali village are located within the radius of 0-9km from the mines. Total population of Jambubahali village is 1020 whereas that of Hensmul village is 1112. People from community i.e. Schedule Caste, General, Other backward castes are present in the sample villages which indicate of a mixed social composition. No Scheduled tribe population is present in the sample villages. The total number of household is 158 in Jambubahali whereas the total number of household in

Hensmul is around 167. The livelihood that people have in the villages is either they are employed by the mining companies permanently or they work as a wage labour. There is acute problem of water in the villages and the electricity is available.

2.5 Demographic features of sample villages

Table no. 2.3: Demographic Features

	Sample Villages		
Basic Data	**Jambubahali**	**Hensmul**	**Total**
Total Household	160	165	325
Sample Household	50	50	100
SC Household	15	24	39
ST Household	0	0	0
OBC Household	33	5	38
General household	2	21	23

Source: Field study

The above table states about the demographic features of the affected villages. Village Jambubahali is having a total of 160 household and village Hensmul is having a total of 165 household. 50 sample villages for the study has been taken from both the villages. The total number of household in the study area is 325 out of which 100 households are taken for the

study. The population is mainly dominated by the Other Backward Caste (OBC) followed by the General caste. There is no ST household in the sample population.

2.6 Occupation

At the time of data analysis it was found that there is a huge change in the occupation scenario of the villagers. The traditional occupation of the people has been replaced after the inception of mining. The following table gives detailed analysis with regard to the occupation scenario of the head of different household in the sample villages:

Table no. 2.4: Occupation of the Head of the household

Occupation	Sample Villages
Cultivation	7
Dairy	1
Daily wage labourer	18
Skilled wage labourer	6
Semi/unskilled wage labourer	8
Service-Private Sector	3
Service-govt. Sector	52
Trade/business	4
Other Self-employed	1
Total	100

Source: Field study

The above table shows that majority of the head of the household (around 52%) are engaged in government sector jobs which is basically jobs in the nearby mining companies whereas only 7% of the villagers continue cultivation. 18% of the head of the households work as daily wage labourer and only 1% of head of the household are engaged in dairy and trade business

respectively. The above table clearly shows that after the inception of mining in the affected villages; agriculture as an occupation has received a big blow and has been replaced by jobs on the mining sector.

2.7 Land Acquisition

Mining activities cannot be started start without land acquisition and land is an important asset for the people. Without land, any project be it mining, river water project, infrastructure etc. cannot commence. In the sample villages it was observed that the land of the villagers have been completely acquired by the mining companies. Earlier villagers used the land for cultivation but now the situation has changed. The following table reflects about the extent of land acquisition in the sample villages.

Table no. 2.5: Land acquisition

Name of the village	Total Land	Landless	Total
Hensmul	42	8	50
Jambubahali	47	3	50
Total	89	11	100

Source: Field Study

The above table shows that around 84% of the sample population has lost their land due to mining in the village of Hensmul whereas around 94% of the sample population has lost their land due to the inception of mining in the village of Jambubahali. Land acquisition is the central reason because of which only a few percentages of villagers have cultivation as their occupation.

2.8 Composition of Sex and Age

Sex and age are two of the important demographic features of a population. Sex states whether an individual as male or female whereas age states about the stage of human life. In the present study around 95% of the respondents were male whereas only 5% of the respondents were

female. It was found out that from the field study that around 53% of the respondents of the sample village are in the range of 40-60 years. Only 1% of the respondent is in the range of 80 year of age. The following table reflects about the age and sex composition of the sample villages:

Table no. 2.6 Sex & Age of the Respondents

Age of the Respondents	**Sample Villages**	
	Male	**Female**
18-40	17	0
40-60	50	3
60-80	27	2
80 & Above	1	0
Total	95	5
Grand Total	100	

Source: Field Study

2.9 Educational Status

Education plays a fundamental role in the development process. Education is an important tool for the upliftment of any society as a whole. In the present study it was revealed that around 16% of the respondents are illiterate and around 26% of the respondents are literate. The table drawn below shows that only 6% of the respondents have graduated and only 1% of respondents went

for any professional qualification. Villagers exclaimed that, after the inception of mining the zeal for higher education has received a big setback as villagers after attaining primary education or matriculation work in the mining companies or mining related business.

Table no.2.7: Educational Status of the Head of the Households

Education	Sample villages
Illiterate	16
Literate	26
Primary	14
Middle	16
Matriculate	12
Intermediate	09
Graduate and above	06
Professional qualification	01
Total	100

Source: Field study

2.10 Annual Income of Family

There has been a significant change in the income status of the villagers in the sample villages. More than 90% of the villagers exclaimed that the difference between the income pattern during the pre –mining and post-mining period is very significant and unprecedented due to the fact that the mining has brought money economy which was not there before when they did cultivation. Earlier the livelihood was subsistence in nature which has changed over the period of time. The following table gives a detailed picture about the annual income of the families:

Table no.2.8: Annual Income of the Family

Income	Sample villages
Below 11000	3
11000- 25000	12
25000- 50000	22
50000- 1 lakh	16
1 lakh - 2.5 lakh	40
2.5 lakh- 5 lakh	05
5 lakh - 7.5 lakh	01
7.5 lakh- 10 lakh	01
Total	100

Source: Field Study

From the data garnered from the field study it is clear that around 40% of the households are having income within 2.5 lakhs and around 16% of the households are having income within 1 lakh. There has been a significant rise in income of the villagers with the inception of mining, the villagers exclaimed.

CHAPTER 3
IMPACT ON ENVIRONMENT AND HEALTH

3.1 Introduction

There are number of activities which are associated with coal mining that includes blasting, drilling, loading, unloading, transportation of coal etc. These activities give rise to pollutants which affect not only the environment but the health of the local inhabitants in general. There is considerable impact of opencast coal mining when it comes to environment. The overburden dumps, mines waste after combustion gives out sulphurous fumes which are poisonous (Lloyd, 2004).

Environment and Health are inter-related. The harmful impact of coal mining degrades the environment in particular, and the human being is well surrounded by the environment; so any damage cost to the environment will result in health degradation of the people. The present chapter primarily focuses on the impact of coal mining on environment and health in the two sample villages of Talcher.

According to Physician for Social Responsibility (PSR, 2009), coal when burns emits out mercury, sulfur dioxide, nitrogen oxides and number of other hazardous substances which are known to cause lethal health problems. The respiratory system, cardiovascular system, nervous system is badly affected.

Coal mining in India generates astronomical amount of revenue for the nation but the hard hitting fact is that the serious repercussions that coal mining has brought with respect to health and environment cannot be overlooked. Along with air pollution, water pollution and noise pollution it was revealed that diseases like skin diseases, water diseases, gastric and fever are widespread. Ponds and other water bodies are constantly polluted by the dust which comes out from the mining activities which has made the life of the villagers a living hell. Along with the water bodies, the houses of the villagers have been dilapidated by the blasting effects. In the present chapter an attempt has been made to chalk out the ill effects of coal mining on environment and health.

3.2 Coal Mining and its Impact on Environment

In the sample villages it was found out that, almost all the activities related to opencast coal mining such as unloading and loading of coal, transportation of coal, poor condition of roads and huge quantities of open air coal burning by the villagers are responsible for air pollution which has led to serious implications on the natural environment. Before the operation of mining the villagers were not habituated of the adverse environment degradation but after mining came into play all is not well for the Nature as well as the villagers.

It was found out that when coalburns, it generates huge amount of solid wastes which contains toxic compounds such as arsenic, cadmium, lead etc. If these harmful, toxic metal leaches into the water bodies of villages than there will be huge price to pay for the villagers. Research work done suggests that if the villagers consume toxic affected water than villagers will have high chances of cancer. It was also observed that trucks which were used to carry coal from one place to another was uncovered and as a result dust particles mixed with the air and caused air pollution. Also, train which is used to transport coal was seen uncovered. The coal which falls of

from the train ultimately mixes with the water body or. MCL officials stated that there are no periodic raids conducted by the Regional Transport Office (RTO) for checking uncovered trucks. MCL official claimed that around 85% of the coal is transported via rail network and around 15% of the coal is transported via trucks and other road transports.

Respondents also exclaimed that water sprinklers are not used round the clock because of which it is very often to find dust laden air in and around the villages and roads. Villagers also claimed that the overloading of trucks is not being checked by the authorities. The mining companies have abandoned all the pollution norms which have raised eyebrows. According to the MET department of Government of Odisha, Talcher is one of the hottest regions in Odisha, and what adds to the intolerable heat is mine fire. It was frequently observed that coal catches fire during exploration and it takes a lot of time for the sprinklers or water sprays to extinguish the fire which generates heat and makes the surrounding an uncomforted zone.

The mining companies are not serious in terms of the problems related to air pollution. MCL lauds itself to the fact that they use blast-less technology which prevents dust generation but it seemed that either the technology is a complete failure or MCL is not serious about it. During the field study it was also found out that the mitigation measure is not taken by the mining company in a regular fashion. For instance, water sprinkling, manual sweeping is not done regularly etc.

Table no. 3.1 Respondents response towards pollution

Name of the village	**Yes**	**No**
Hensmul	50	0
Jambubahali	50	0
Total	100	0

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Source: Field Study

The above table gives an unprecedented figure. It was revealed that 100% of the villagers felt that indeed mining has polluted the local environment which has affected their life disproportionately. The local environment has got polluted after the continuous exploration of mines. Activities such as drilling, blasting, transportation generates large amount of dust particles. Villagers also exclaimed that the working condition of the employees is not conducive and the atmosphere is choking their life out. Before the inception of mining the environment was pretty conducive but after the inception of mining the condition of the environment has degraded.

During summer season, the condition is pretty worse. The high range of temperature in Talcher mines area aggravates the worse off situation. Mine fire has also become a major issue during the summer season. It was found out that, stocks of coal which are kept in the mining areas catches fire which makes the environment polluted. Mining companies though aware of the situation do not take proactive step in this regard and therefore the villagers have to bear the consequences of increased temperature in their area.

Amid interaction with the mining company officials it was found out that the officials are well aware about the sickening realities of soaring pollution due to transportation, stacking and emptying of coal but still then proactive measures with regards to making perpetual and vital technique to counter pollution is still awaited. Though there has been certain technology which is in use by the mining companies but the effectiveness of the technology has been questioned by the villagers. For instance, blast less technology which is being used during exploration is not as efficient as the mining companies' lauds and the water sprinkling is not being done in a regular fashion. Support of settled and portable water sprinklers on streets, track sidings, stock yards and so forth are additionally not done by the MCL in a customary manner.

The villagers additionally reported that MCL has straightforwardly cut around lakhs of trees and has never planted a solitary plant in their towns. The importance of trees in the villages are manifold, trees not only yielded organic products for the villagers but also cleaned the environment. The barbaric activities of deforestation and not going for afforestation have straightforwardly ridiculed the natural laws. Mining companies in collaboration with the forest

department should undertake afforestation programs. NGO's should come up with innovative ideas to make environment lush green.

The voice of the common villagers is being constantly suppressed by the mining companies. The elected representatives of the villages are been lured. There has been a rise in the contractor class people in the villages. The main reason behind the people's failure in raising voice for themselves is mining, which has jeopardized and has fragmented their social cohesion. People are only bothered about individualism and not for the village as whole.

Table no. 3.2: Respondents response towards the MCL's initiation to mitigate the pollution caused by mining

Name of the village	**Yes**	**No**	**Total**
Hensmul	4	46	50
Jambubahali	0	50	50
Total	4	96	100

Source: Field Study

The above table 3.2 reveals that MCL is not at all serious when it comes to mitigation of pollution. The responses from the villagers were analysed altogether and it is revealed that around 96% of the sample villagers have a belief that MCL is not taking sufficient measures to

combat, arrest pollution in the mining areas. Further, only a mere 4% of the sample villagers reported that MCL is taking steps to counter pollution in their areas.

It was very shocking to come across an abandoned mining near Jambubahali which has become a test for nature furthermore a danger for the entire living creatures. The abandoned mines should be backfilled after its exploration but the same has not been done by the mining companies, in spite of the fact that there are stringent laws with regard to the closure of mines but that's been openly flaunted by the mining companies. Villagers of Jambubahali asserted that the abandoned mines have claimed number of lives of both humans as well as animals but MCL has not learnt lessons despite number of complains which have been made to the authority, but no action has been taken in this regard.

Abandoned mine has become a breeding hub for mosquitoes and other harmful insects which always pose threat to the villagers. MCL need to understand the seriousness of the issue but nothing has been done to deter the menace of abandoned mining. Mining companies should utilize the top soil for the effective reclamation of the abandoned mines but that's not being done. Further, effective plantation should be earmarked in the abandoned mine area for the reclamation. As per the Mining Closure Plan, MCL should undertake nitrogen fixing tree species plantation along with fruit bearing tree species for successful reclamation but the contrary is happening and the abandoned mine is being used as a dumping ground which has made the environment degradable and uncongenial.

More than 90% of the villagers claimed that, neither the mining authority nor the state government are undertaking any proactive measures for the reclamation of abandoned mines. Though people's representative have highlighted the sensitive issue to the higher authority but the action taken has been void which also reflects about the attitude of the higher authority.

3.3 Water Pollution

Villagers are very much concerned with the pollution of water bodies in their areas. Villagers claimed that the dirty water which consists of coal sludge and coal waste are left out in the water bodies which not only makes water unfit for drinking but also makes water unfit for any

domestic work such as cleansing, bathing etc. Prior to the inception of mining, villagers used to take bath in the community pond which at the present point of time has either dried up due to extremes of temperature or has turned into pond full of dust and filth. It was observed in the villages that heaps of coal waste and soil often got mixed up with the water bodies. Villagers are very much troubled by the impact of coal mining on water, in particular the women and children. Women in general carries out household work and use much of the water resources for domestic purpose.

Villagers also complained that the taste of drinking water has undergone changes which they attribute to mining. MCL has been overexploiting the water of river Brahmani, and the government is silent in this regard. Villagers, who were fisherman, have lost their livelihood and are working as wage labours in the mining companies. Drinking water crisis in the villages has raised eyebrows. Women have to stand long in the queue waiting for their turn to get water which is supplied by tankers which is generally irregular.

Coal mining has not only exasperated the water quality in the towns but has also resulted in water shortage. Villagers are very suspicious of the MCL's role in the conservation of water resources. Few learned villagers have likewise reported that MCL is persistently misusing the ground water assets in a ceaseless way which has influenced the water table in their general vicinity. Tube wells are not giving out water as it used to be before. In the context of adding bleaching powder to the water bodies, almost more than 98% of the sample households claimed that MCL has never carried out any programs related to adding bleaching powder to the water resources.

Table no. 3.3: Respondents response regarding Sources of water pollution

Sources of water pollution	**Frequency**
Mining water going to existing water sources	44

No recycling	05
Dumping ash	39
All	12
Total	100

Source: Field study

In the above table 3.1, it is reflected that out of 100 households selected for the field study, around 44% of the respondents stated that mining water which is composed of coal related waste mixes with the water bodies whereas around 39% of the respondents reported that water pollution happens due to dumping of ash .

It was observed that when coal loaded trucks moved from one place to another, coal often fell from the trucks and came in contact with the water bodies. The coal laden trucks were generally uncovered. Villagers have protested against the inactive role of the MCL in mitigating water pollution but the MCL authorities have feigned ignorance in this regard. MCL has disrespected the just demands of the villagers to curb pollution both in latter and in spirit.

3.4 Noise Pollution

Exploration of minerals includes number of process. In the context of coal, the major activities includes blasting, drilling. Blasting and drilling works which takes place at the mining sites have disrupted the quality of lives not only for the mine workers but also for the villagers who are living nearby. Blasting has a tremendous impact in the nearby villages. Villagers reported that when blasting takes place in the quarry, the surface of the land shakes along with the ground which has made the villagers annoyed. Drilling activities, which take place in the mine, produces loud noise which has raised discontentment.

One of the side effects of the blasting that has emerged is house cracking. It was observed that most of the house in the villages had cracks in its structure. Villagers are very much disgruntled

about the fact that their money spent in house constructions are going in vain. It came to light that the elected village representatives along with the villagers have complained about the ill effects of blasting to the Project Manager and the General Manager in person but the reply and action which the authority has taken is not convincing, the villagers said. House cracking has resulted in irreparable loss to the villagers.

Children in particular are the worst affected. The constant loading and unloading works, moving of heavy vehicles, has created mayhem and parents reported that children are unable to concentrate in their studies. Noise pollution has resulted in mental disturbance and the people are not happy with it.

Table no. 3.4: Different types of problems faced by household due to noise pollution

Problem faced due to noise pollution	Frequency
Hearing	3
Mental disturbance	7
Student study disturb	26
House cracking	64
Total	100

Source: Field study

The above table shows the different types of problems, which the villagers face due to noise pollution. Around 64% of the respondents stated that they have house cracks in their house due to vibration which comes out from blasting and drilling. Around 26% of the respondents answered that student's study has been greatly disturbed by noise pollution. Around 7% of the respondents replied that they are suffering from mental disturbance and around 3% of the

respondents said that they suffer from hearing problem. It is very ridiculous that where the MCL lauds that they are using blast-less technology but the so called blast-less technology has ruined the life of the villagers. Noise pollution has resulted in serious implication for the nearby villagers.

3.5 Impact on Health

Different types of coal related exercises have brought about the disturbance in the ecology which has hit the well-being status of the villagers. Environment degradation has not only given a big jolt to the Nature, but has also affected the villager's health disproportionately. When the different sample households were asked about the health problems after the inception of mining, they were very much apprehensive about their health status. For instance, villagers exclaimed that, due to environmental pollution and their prolonged exposure to the polluted environment their health status is not at all good. There's always skin irritation, different allergies, eye irritations, and the occurrence of harmful diseases has more than doubled. Breathing in of air toxins is activating asthma assaults, respiratory diseases, or changes in lung capacity. Mining of coal has uncovered the specialists and neighborhood groups to perilous coal dust, and diesel emanations from coal transport which has sick consequences for the wellbeing state of the villagers.

Villagers exclaimed that women and children in particular are facing the dire consequences of mining. There has been increase in the number of cases of hospitalizations, medical expenses, stress, trauma, physical exploitation etc. More than 80% of the sample households guaranteed that recurrence of women and childrento different maladies have expanded tremendously after post mining. Because of consistent introduction of dust particles they are more inclined to the infections like skin contaminations furthermore encountering failing of different tactile organs, which have a long haul effect on their conceptive wellbeing.

The condition of the family members of a nonemployee of MCL is of worst kind. A non-employee of MCL does not get all the privilege vis-à-vis the employee of MCL and as a result of which they are suffering a lot. Due to financial constraint a non-employees family, women of the family along with the other family members chooses to uncover themselves and their children to

serious wellbeing dangers, which undermines their lives. As indicated by the villagers the recurrence of ailments likewise expanded in complex periods i.e. tuberculosis, hack and frosty, fever, skin maladies, looseness of the bowels, recoloring of teeth, joints torment, joint pain, dormancy are currently the habitually happening illnesses in the mining influenced towns.

Families who are residing very near to the mining areas have the highest probability of getting affected by mining. They have the maximum probability of getting injured and fatalities. The dangers associated from the air contamination in the influenced towns have increased significantly as the villagers are persistently being presented to unsafe contaminations for a long term which may prompt genuine setbacks in the impending days. The Talcher-Angul coal cinch was supposedly considered as the most noteworthy temperature zone generally amid summer. This cinch of Odisha is considered as one of the most blazing places in the state amid summer the temperature ascensions almost 47-48 degree centigrade. Not just the representatives are travailing of a few wellbeing issues additionally a few non-workers of MCL reported that they excessively are experiencing sicknesses like skin diseases, respiratory infections, asthma, TB and so on. As they are nonemployee of MCL they are not furnished with satisfactory treatment office in the MCL clinics. Thusly an immense piece of their salary goes futile because of the coal mining related wellbeing issues.

Table no. 3.4: Major Health Problems faced by Households in Talcher Coalfield

DISEASES	HOUSEHOLD AFFECTED
Fever	16
Gastric Disorders	19
Skin Diseases	20
TB	10
Eye allergy	18

Asthma	09
Arthritis	08
Total Households suffer	100

Source: Field Study

The above table reflects about the various types of diseases which are faced by the household after the inception of mining. From the responses that were received from the head of different households on the type of health problems, it came into light that among the sample household, skin disease is very much widespread which accounts for around 20% followed by gastric disorder which accounts for 19% of the total health problem. Villagers exclaimed that in the pre mining era, they never experienced such diseases frequently but it's due to the ill effects of coal mining that has resulted in an increase in the frequency of diseases. Fever and eye allergy are also rampant in the sample villages. 16% of the households faces from fever on regular basis whereas 18 % of the household reported of having eye allergy on regular basis. Villagers expressed that the major health concern which is emerging in their villages are Tuberculosis (TB), and Asthma. During field study it was revealed that around 10% of the household reported regarding the problem of TB followed by 9% of the sample household reported of having asthma. 8% of the household have suffered from arthritis after the inception of mining.

The disease profile which is obtained from the field study reflects about the deteriorating and dismal health condition of the villagers in the coal mining area. The poor families who are particularly non-employees of MCL have to bear the brunt as MCL has not devised any health plans for non-employees. Free medical facilities are only delivered to the employees of MCL. When interacted with the officials of MCL on issues related to free medical treatment of non-employees, they rebutted that they do not have such plans for them in the near future. Non employees in particular are the worst affected in the mining affected villages.

Villagers also exclaimed that nonstop coal mining near Jambubahali has given rise to different health related issues. Amid field examination it was discovered that refuse stores have been gathered with no treatment and support which has turned into a hazard in the towns. Abandoned

mines have ended up as dumping yards and have become reproducing grounds of mosquitoes in the study ranges. MCL has utilized not very many specialists in the focal doctor's facility furthermore the wellbeing costs of a non-worker are not borne independent from anyone else which upshot a terrible disappointment.

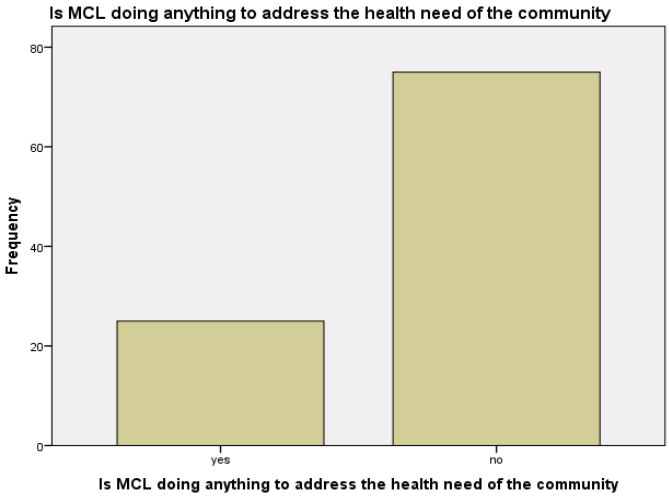
The occupants of mining influenced towns likewise reported that relinquished mines have resulted in number of deaths of livestock. There has been number of instances where numbers of cow, goats have fallen in the abandoned mines and have died on. MCL is not at all serious in terms of pacifying the problems of the villagers by reclaiming the abandoned mines. Villagers asserted that abandoned mines are brimming with perils everything from snakes to explosives, with spoiled timbers and disintegrating shafts that living creatures can fall into. The mines are dark to the point that if anything falls in it nothing can be seen. There were numerous frequencies when few individuals, creatures were caught in the mines and got deadly wounds.

Malaria and dengue in Jambubahali are widespread due to the fact that abandoned mines have become a safe haven for mosquitoes to breed. It is quite obvious that there are serious health related issues which have emerged due to the abandoned mining but the lack of willingness and seriousness of the MCL authorities and the state administration as well has resulted in a disappointment as well as annoyance amongst the villagers.

3.6 Community Health Welfare

Public sector organisations such as MCL boast that they are doing a heck of a job for the community as a whole and not only for a particular section of the society. However the reality seems to be something different. The policy of providing free medical services to an employee of MCL and providing only medical check-up for rupee two devoid of any free medicines for a non- employee class of workers has added mother lode of gasoline. Any non-employee who is suffering from various diseases which are borne due to mining activities and is not provided health services from the same mining organisations is absolutely ridiculous. The policies need to be amalgamated and changed for the welfare of the society and to remove all the differences from the society.

Figure No 3.1: Mining and Health of the Community



Source: Field study

The above bar graph which has been drawn from the responses that were garnered during the field study clearly shows about the hypocrisy which is done by the MCL for village welfare. About 75%of the villagers revealed that MCL is not doing anything in order to address the health need of the community. MCL should envisage in building up of comprehensive welfare programme for the betterment of both employee class and non-employee class which is not being carried out by the MCL authorities.

A comprehensive welfare programme should be useful in the sense that even the weaker sections of the society including women and children who form the delicate part of the society would be ensured of physical, mental fitness. Health issues which has already erupted no doubt should be pacified but it is also necessary to take steps to prevent the occurrence of new problems. Steps such as regular cleaning of ponds and other water resources should be particularly given emphasis.

Bleaching powder should be regularly added by the MCL. In order to combat the menace of Malaria and to prevent Dengue squads should be built up which would deal with the activity of spraying mosquito combating gases regularly. When contacted MCL authorities and doctors they were beating the bush that regular health camps are being organized to make health awareness

among the communities. They retaliated that several kinds of preventive health care services such as school health programmes, Family welfare camps and eye camps, distribution of free medicines are done regularly however villagers didn't repeated the same lines. Villagers are very much sceptical about the credibility of the mining company.

3.7 Other Health Problems

More than 60% of the villagers reported that the incidence of diarrhea, dysentery and eosinophil has increased to a very great extent due to the fact that mining company has failed in its attempt to deter different sources of pollution. Most of the children in the villages were seen having white spots around their body. Livestock were seen drinking polluted water and villagers exclaimed that they have stopped domesticating livestock because they are becoming succumbed to the excess pollution. Cows in the affected villages eat plastic in the absence of grass, villagers said. The sources of water have decreased which has affected the women in particular.

Forest land has been cleared by the MCL which in turn has depleted all the fruit bearing trees, common property resources etc. This has affected the nutritional status of the villagers at large. Medical services and medicine now are available in the medical stores which cost very high and the plight of a non-employee of MCL in this regard is very disgusting. Several Non-employee class revealed that they have to neglect their illness as they do not have the right to access MCL sponsored medical services nor have they have the requisite money to go for primary treatment. The worst sufferers are the women and children. When contacted with some of the doctors of hospitals they openly expressed that they are into this profession since many years and they claimed that the primary reason responsible for the poor health status and diseases for the villagers is mining.

CHAPTER 4

INSTITUTIONS AND CAMPA

4.1 Non-Governmental Organization (NGO)

A Non-Governmental Organization (NGO) is a body that is neither a piece of an administration nor ordinary revenue driven business. NGOs are organizations which work for the public. NGOs are formed by the citizens and it may be financed by private persons, charity, governments etc. NGOs are very assorted gatherings of associations occupied with an extensive variety of exercises, and take diverse structures in distinctive parts of the world. Some may have magnanimous status, while others may be enlisted for duty exception taking into account social purposes. NGOs may also work solely for political purpose or faith based purpose

NGOs primarily focus upon social equity, sustainable development and human rights. The privilege to impart uninhibitedly is an essential human right and a need for maintainable advancement. Access to data is fundamental to educated choice making at all levels. NGOs work for the people in general. It not only helps in disseminating of various data from the government to the public but also works for the sections of the society which are affected disproportionately

in spheres of health, nutrition, education etc. For connecting the information hole and enhancing data accessibility NGO system is resolved to create and build a perfect medium for the Participation and trade of a trusted and precise wellspring of value data.

NGO works at various levels be it local level, national level or international level as per the requirements and the funds availability and operational limit. NGOs works on various subjects such as creating political awareness, women empowerment, welfare of the animals, social security, livelihood related issues, infrastructure development etc. NGO Works and backings to represent and execute laws, attempts to make laws and approaches for welfare and change of human life in shared concern.

NGO lives up to the expectations for the betterment and upliftment of socio-monetarily and politically weaker area of group to get them better standard of living and move the general public towards more enhanced and grew method for living and existence. NGOs help the downtrodden people to get their legitimate rights in general.

In the two mining villages that were selected for the field study, the working of the NGOs is not palatable. In both the mining affected villages not even a solitary NGO was discovered working with the individuals and for the individuals. They are practically absent in the mining towns. At the time of taking response from the villagers about the working of NGOs in their general vicinity it was very confounding that the villagers did not had any idea about what a NGO is. Few of the villagers who are literate exclaimed that though Odisha is having a number of NGOs relatively, it is very painful for their part as to none of them are working to pacify the diverse issues that exists in the mining affected villages.

100% of the villagers responded that NGO is practically absent in their villages in spite of the fact that their villages are a good platform for the NGOs to work in because the issues here are diversified. Issues which exists ranges from wellbeing, environment, compensation, security, adulterated water, power, livelihood, forest management and forest rights etc. NGOs now and again could have represented themselves as spokespersons for the poor and endeavor to impact government strategies and projects for their sake keeping in mind the end goal to settle the

question.Consequently NGOs have a tremendous part to play in the towns extending from backers for the poor to implementers of government projects; from instigators and commentators to accomplices and counsels; from patrons of pilot tasks to go between. The number of contentions among the administration, villagers and MCL is expanding in recurrence step by step. There are frequent faceoff between the mining companies and the villagers. NGOs at times could have gotten to be the representative from the village side and endeavor to impact government approaches and programs for their sake to settle the debate.

NGOs have a tremendous part to play in the villages going from promoters for the poor to implementers of government projects; from fomenters and commentators to accomplices and consultants; from backers of pilot tasks to arbiters. The quantity of government welfare plans and measures, for example, BPL card, Indira Awas, Job card are not circulated in the villages in extent so NGOs would have supported the need of these measures in a fitting channel that would have helped the villagers in gross.

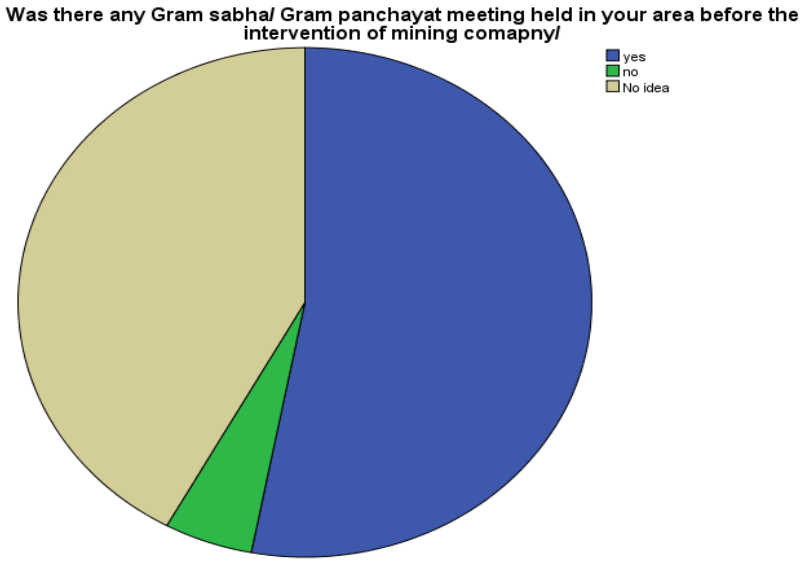
4.2 Gram Sabha/ Gram Panchayat

Gram Sabha and or the chosen leader of the village has number of obligation, for example keeping up road lights, development and repair work of streets in towns, maintenance of town markets, fairs, accumulation of duty, celebrations, festivals, keeping a record of births, passing and relational unions in the town, caring for general wellbeing and cleanliness by giving offices to sanitation and drinking water, giving free training to sort out the gatherings of Gram Sabha and Gram Panchayat ,giving wellbeing administrations and offices.

The primary task of the Gram Sabha and Gram Panchayat has been to take up issues relating the villagers to the pinnacle level where needy individuals can't achieve so that their voices could be heard, their situation could be made known and the same can be solved. The extent of working of Gram Sabha is enormous and it includes viewpoints, for example, people, groups, woods, nature, environment, cleanliness, and so forth. Quantities of welfare projects are given to the villagers, for example, IndraAwaas, Below Poverty Line card, National Rural Employment Guarantee Scheme (NREGA).

It is the duty of the Gram Sabha to ensure that the poor villagers do get the profit of the government programs meant for the rural people. The Gram Sabha goes about as a medium between the administration and the individuals.

Fig 4.1: Gram Sabha and Gram Panchayat Meeting



Source: Field Study

The above pie chart shows that around 53% of the respondents claimed that there was Gram Sabha/ Gram Panchayat meeting was held before the intervention of the mining villages. Around 4% of the respondents said that meeting was not convened. But 43% of the respondents stated that they did not have any idea regarding the meeting in their villages. The fact of the matter is that Gram Sabha/ Gram Panchayat meeting was held way back before the 1990's and number of respondents were not born at that point of time. The individuals who were available said that the

whole meeting was focus on pay and employment designation. Because of absence of data, destitution, insignificance and trepidation towards the power rest of the villagers were not show in the meeting. Whatever remains of the villagers who are not mindful about the meeting called by Gram Panchayat said that they were not under any condition educated about the meeting. They guaranteed that Sarpanch may have assembled the conference to pass the data to their devotees.

In the present context, it was observed in the village that Gram Sabha/Panchayat is losing its importance. Number of villagers stated that the Sarpanch of the villages are regularly baited by the mining organizations and are being paid protuberance aggregate measure of cash so that they would not grumble against MCL to the administration power and would not pass any determination in the Gram Sabha that would have unfavorable effect on the working of the mining companies. Close aid of the Sarpanch have formed nexus with the mining companies and a new class of people has emerged i.e. the contractor class of people. In majority of areas there were no provisions of clean drinking water, medical facilities etc. The Corporate Social Responsibility has not lived up to its expectations and the elected heads are not taking cognizance of the same. Actually individuals in the towns are losing their trusts in regards to the believability of foundations like Gram Sabha which were seen as a device for the destitute individuals.

4.3 Utilization of CAMPA Fund

In the contemporary era, there is a need for development, if a country wants to increase its economic condition, provide employment and raw materials. Therefore, number of infrastructure projects, river dam projects, and mines projects requires diversion of forest areas in a larger scale. Before the initiation of any project, whether government or private must seek forest clearance from Ministry of Environment and Forests (MoEF), before the transformation of area occur. This proposition is to be submitted through the concerned forest department of the state government.

After the clearance has been given by the concerned authority for the diversion of forest, the compensation for the loss of forest land, trees is to be decided by the regulators. In this process,

project owners have to submit the remuneration NPV, Compensatory Afforestation Fund Management and Planning Authority (CAMPA) fund and Wild life conservation fund if it exists. Compensatory Afforestation Fund Management and Planning Authority (CAMPA) are intended to advance afforestation programs and recovery exercises as a method for making up for the losses incurred after the diversion of forest land due to various projects. The National CAMPA Advisory Council was formulated as per the order of the Hon'ble Supreme Court. The council needs to formulate broad guidelines for State CAMPA, ensure technical and scientific assistance along with other recommendations for its better working.

As per the directions of The Hon'ble Supreme Court, there shall be a State CAMPA in each and every state every state which would receive funds from the organization which has used forest land for development projects. Funds will be utilized for compensatory afforestation and penal compensatory afforestation. The State CAMPA is entrusted with the task of utilization of the funds for implementation of compensatory afforestation programs, conservation of forest, wildlife, natural regeneration etc. State CAMPA would also impart skills and training program for the State Forest Department at various levels.

Each state has three main bodies the Governing body, Executive Committee and Steering Committee; all the three bodies would look after the utilization of CAMPA fund. The Governing body prepares the policy framework under the leadership of the Chief Minister. The Steering Committee is responsible for formation of rules, norms, procedure and monitoring of the progress of fund utilization. The Executive committee is headed by the Principal Chief Conservator of Forest (PCCF), which prepares the Annual Plan of Operation and submits the same to the Steering Committee for approval. After the approval of APO, the plan is sent to the e Ad-hoc CAMPA and then the fund get transferred to the nodal agency and then the State CAMPA implements various programs as per the approved APO.

As per the records available in the Department of Environment and Forest, Govt. of Odisha, the State Government has deposited around rupees 28,591,478,876/- to ADHOC CAMPA since 2009 till 2013.

Table no: 4.1: Detail financial status of CAMPA fund and its Expenditure (in crore)

APO	**Outlay**	**Date of receipt of funds**	**Fund received from Adhoc CAMPA**	**Expenditure incurred**
2009-10	238.3975	25.8.09	131.0618	124.1193 (Final)
2010-11	140.1753	18.01.11	140.1753	88.7213 (Final)
2011-12	169.89101	26.08. 11 04.06.12	166.021005 3.87	120.2379 (Final)
Addl. APO 2011-12	6.20	04.06.12	6.20	0

2012-13	265.26933	03.12.12	205.8244	129.8788
2013-14	214.0059	01.07.2014	180.00	4.7172

Source: Annual Activity Report- 2012-13, Forest and Environment Department, Govt. of Odisha

The above table states about the expenditure incurred in crores in terms of utilization of CAMPA funds. During the year 2009-2010, fund received from Ad-hoc- CAMPA was Rs. 131.0618cr whereas the expenditure incurred was Rs 124.1193cr. During the year 2010-11, fund received from Ad-hoc- CAMPA was 140.1753cr whereas the expenditure incurred was only Rs 88.7213cr. During the year 2010-11, fund received from Ad-hoc- CAMPA was around 175 cr whereas the expenditure incurred was Rs120.2379cr. During the year 2010-11, fund received from Ad-hoc- CAMPA was 205.8244cr whereas the expenditure incurred was only Rs129.8788 cr. During the year 2013-14, fund received from Ad-hoc- CAMPA was 180cr whereas the expenditure incurred was only Rs4 cr. This demonstrates lack of foresight & wasteful execution by State CAMPA and Forest division also. Underutilization of trusts raises concerns on states absorptive limit of the State Forest divisions.

According to the Ministry of Environment and Forest, Govt. of Odisha MCL has deposited Rs. 702526300/- to central CAMPA fund through the State Government for different project in the Angul district. In the last five years the Angul forest division has received around 167412000 rupees from State CAMPA fund. However, in the case of expenditure it has spent only 153910240 rupees till the end of November, 2014.

The Forest dept. has a critical part as far as using CAMPA store. Yet it is truly stunning to establish that the authorities who are managing CAMPA are not completely mindful about State CAMPA rule. At the time of interaction with forest department officials it is ascertained that the officers managing CAMPA at the grass root level neither have the prerequisite knowledge nor are they willing to learn. More than 90% of the villagers guaranteed that the forest department has never initiated any kind of afforestation program in the village areas.

In both the sample villages, none of the respondents were able to respond to the questions related to CAMPA; this ascertains their lack of awareness and passiveness of the forest department officials in giving proper attention to the issues of the forest. Inaction in the sphere of reclamation of forest has become a burning issue.

Also, villagers accused the Gram Sabha for not taking proactive measures in the restoration of forest areas, nor the Gram Sabha is forcing the authority to do so. Moreover, the passive role of the forest department is a matter of huge concern. The forest department officials are not at all taking any sorts of measure to promote movement of youth and students for supporting on going conservation activities and new activities initiated in the State Forest Department.

CHAPTER V
SUMMARY AND CONCLUSION

To accomplish the goals of the study two mining influenced villages were chosen. An aggregate of 50 Households in light of ethnic creation were chosen for identification from each of the towns. Subsequently an aggregate of 100 such family units were the specimen for the study. Information gathered was both subjective and quantitative and the same was investigated utilizing SPSS. Taking into account the investigation, it can be said that mining has a blended effect on the individuals' way of life. Despite the fact that after dislodging monetary addition of the villagers have expanded exponentially with differentiated vocation and business open doors when contrasted with the control towns however the difficulties dwarfs the financial additions.

In the specimen villages, it was figured out that, all the exercises identified with opencast coal mining, for example, emptying and stacking of coal, transportation of coal, are responsible of air, water and noise pollution. Prior to the operation of mining the villagers were not habituated of the unfavorable environment pollution however after the mining became possibly the most important factor all is not well for the Nature and additionally the villagers.

It was found out that when coal when burns, it generates huge amount of solid wastes which contains toxic compounds such as arsenic, cadmium, lead etc. The mining companies are not

serious in terms of the problems related to air pollution. It was found out that MCL has straightforwardly cut around lakhs of trees and has never planted a solitary plant in their towns.

It was also found out that the abandoned mining near Jambubahali has become a challenge for the villagers as it has become a breeding hub for mosquitoes. The abandoned mine is not backfilled which in turn become a test for all living creatures and has claimed lives of number of living things. MCL has not taken action despite number of complain which have been made to the authority. The ecological restoration should be done as soon as possible along with effective plantation program.

Coal mining has not only deteriorated the water quality in the towns but has also resulted in water shortage. Villagers are very suspicious of the MCL's role in the conservation of water resources. Ground water is being used assets in a ceaseless way and the tube wells are not giving out water as it used to be before. Bleaching powder is not being added to the domestic water before its use.

Blasting has a tremendous impact in the sample villages. One of the side effects of the blasting that has emerged is house cracking. Villagers are very much disgruntled about it. House cracking has resulted in irreparable loss to the villagers and the authority is not serious about it. Noise pollution has brought about mental disturbance and the individuals are not content with it.

There has been disturbance in the ecology which has derailed the well-being status of the local inhabitants. It was observed that due to environmental pollution, their health status of the villagers is not at all good. There's always skin irritation, different allergies, eye irritations, asthma assaults, respiratory diseases, or changes in lung capacity. There has been increase in the number of cases of hospitalizations, medical expenses, stress, trauma, physical exploitation etc.

A nonemployee of MCL is the worst sufferer of worst kind because they are not subject to getting free treatment. Financial constraint makes them to compromise with their health status. As indicated by the villagers, there has been increase in the occurrence in the frequencies of

disease such as tuberculosis, hack and frosty, fever, skin maladies, looseness of the bowels, recoloring of teeth, joints torment, joint pain etc.

The poor families who are particularly non-employees of MCL have to bear the brunt as MCL has not devised any health plans for non-employees. Free medical facilities are only delivered to the employees of MCL.Malaria and dengue in Jambubahali are widespread due to the fact that abandoned mines have become a safe haven for mosquitoes to breed. Health camps and eye camps, distribution of free medicines are not done regularly by MCL nor are the health awareness programs being carried out by the mining company.

In the two mining villages, there was not a single NGO found working in spite of the fact that Odisha is having a relatively higher number of NGO's. There are number of burning issues in the villages starting from non-distribution of BPL card, Indira Awas, Job, compensation related grievances, land acquisition issues in which the NGO's could have intervened to pacify.

It was also observed that institutions like Gram Sabha/Panchayat are losing its importance. The Sarpanch of the villages are regularly paid by the mining organizations so that they would not initiate any counter action against MCL, villagers asserted. Elected heads are not at all serious about the implementation of various corporate social responsibility programs. Villagers have lost trust in the age old institutions.

There has been gross underutilization, wasteful execution of CAMPA fund by State CAMPA and Forest division. The expenditure incurred is less than the fund received for expenses under CAMPA head in most of the financial years. Forest department official are not aware about the technical aspects related to CAMPA. Moreover, the passive role of the forest department is a matter of huge concern. Awareness programs are not being carried out by the Forest department officials.

It is therefore very necessary that the development induced displacement should take under consideration the plight of the local inhabitants. Monetary as well non-monetary aspects should be looked upon. People should be involved in all the levels of development and the development

should be inclusive. State government along with the mining companies should work hand in hand to pacify the menace of environment degradation, health deterioration of both the employees and non- employees. In this regard, a robust policy to tackle the ill effects of mining is necessary. Institutions should be proactive and their role is very immensely needed.

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